

Abstract of the Disclosure

[0108] This invention relates to a new composition of high surface area materials suitable for adsorption of both organic and inorganic species and as a component of catalysts useful for the transformation of hydrocarbons into a variety of products. These materials are composed by mesoporous spherical particles that have large sorption capacity, as demonstrated by the uptake of nitrogen at 78 K having a diameter of 0.1 to 1.0 microns, a mean pore diameter of 2.0 nm to 4.0 nm, a surface area of 750 to 1050 m²/g and a mean pore volume of 0.75 to 1.0 ml/g. The typical inner structure is composed of nanotubes having diameters around 3.5 nm aligned along the radius of the spherical particles, with surface areas around 1,000 m²/g, depending on the surfactant (C₁₆H₃₃N(CH₃)₃ Br) to co-solvent (C_nH_{2n+1}OH, where n=2,3, or CH₃COCH₃) molar ratio. Elliptical particles are also obtained with cylindrical pores running along or across the major axis of the particles having very high surface areas of up to 1561 m²/g and a mean pore diameter of 2.0 to 4.0 nm. The walls of the nanotubes are pure silica or a composition of silica with M(III)O_x where M is a trivalent metal such as Al, Ga, or lanthanide.